



St. Catherine's School
Waverley

Name: _____

Year 10

Probability Test

Question 1:
(1 mark each)

Match each of the words below with their definition

Outcomes, Even Chance, Sample Space, Not likely, Complementary event, Certainty.

_____ : When the chance of something happening is equal to the chance that it will not happen.

_____ : When the probability of an event occurring equals 1.

_____ : When an experiment is performed, this is the name given to its results.

_____ : The probability of an event not occurring

_____ : The name given to the set of all possible outcomes.

_____ : Description of an outcome which probably will not happen.

Question 2:
(1 mark each)

The probability $P(E)$, of any event occurring must lie in the range

_____ $\leq P(E) \leq$ _____

Question 3:
(1 mark each)

A card is drawn at random from a pack of 52 cards. Find the following probabilities:

a) $P(\text{a spade})$

b) $P(\text{a red card})$

c) $P(\text{not a club})$

d) $P(\text{an ace or a jack})$

Question 4:
(1 mark each)

A bag contains 6 red, 9 blue and 5 yellow balls. If a ball is drawn at random, find the probability that it is:

a) blue _____

b) not yellow _____

c) neither red nor blue _____

Question 5:
(1 mark each)

For each of the following probabilities, use probability terms to describe the likelihood of each outcome occurring

a) $P(\text{event occurring}) = 0.5$

b) $P(\text{event occurring}) = 0.04$

c) $P(\text{event occurring}) = 1$

d) $P(\text{event occurring}) = 0.75$

e) $P(\text{event occurring}) = 0$

f) $P(\text{event occurring}) = 0.1$

Question 6:
(4 marks)

The diagram below represents the possible outcomes of a family having two children.

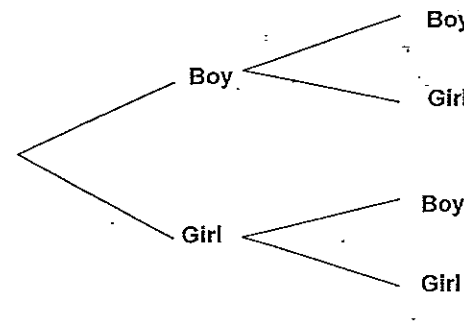
Extend the tree diagram to show all the possible outcomes if the family had three children.

First Child

Second Child

Third Child

Outcomes



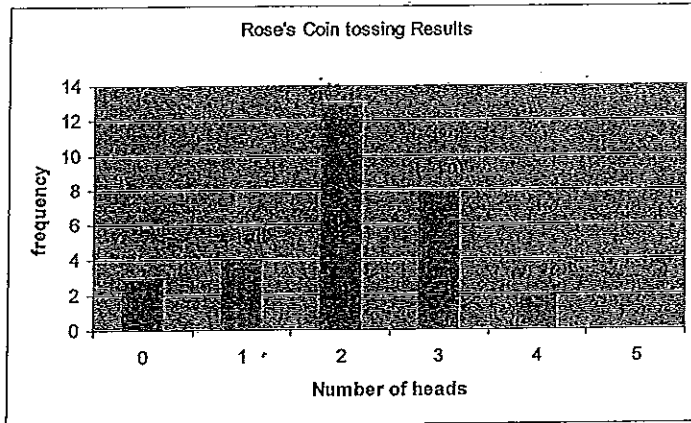
Question 7:
(1 mark)

True or False

"The probability of an event occurring in an experiment is the same as its relative frequency"

Question 8:
(4 marks)

Emily tossed **four coins at the same time** 30 times and the number of heads was recorded each time.
The column graph below shows the results.



From this experiment what is the probability that when four coins are thrown there will be:

- a) no heads _____
 - b) two heads _____
 - c) at least three heads _____
 - d) five heads _____
-

Question 9:
5 (4 marks)

There are four cards marked with the numbers 2, 3, 4 and 5. They are put in a box.
Two cards are selected at random one after the other (ie, the first card is not replaced before the second card is picked), to form a two-digit number.

a) Draw a tree diagram to show all the possible two-digit numbers that can be formed.

b) What is the probability that the number formed is less than 35?

c) What is the probability that the number formed is divisible by 5?

Question 10:
(2 marks)

A bag contains 3 white and 4 brown balls. Two balls are drawn at random, the first not being replaced before the second is drawn. (sketching a quick tree diagram could help with the probabilities on each branch for each possible outcome could help here).
Calculate the following probabilities:

a) P (2 white balls picked)

b) P (A ^{brown} black and a white ball is picked) ^{brown}
(hint: remember that there are more than one ways to get a black and white pair)

End of Test



St. Catherine's School
Waverley

Name: ANSWERS

Year 10

Probability Test

Question 1:
(1 mark each)

Match each of the words below with their definition

Outcomes, Even Chance, Sample Space, Not likely, Complementary event, Certainty.

- even chance ✓: When the chance of something happening is equal to the chance that it will not happen.
- certainty ✓: When the probability of an event occurring equals 1.
- Outcomes ✓: When an experiment is performed, this is the name given to its results.
- Complementary event ✓: The probability of an event not occurring
- sample space ✓: The name given to the set of all possible outcomes.
- not likely ✓: Description of an outcome which probably will not happen.

Question 2:
(1 mark each)

The probability $P(E)$, of any event occurring must lie in the range

0 ≤ P(E) ≤ 1 ✓

Question 3:
(1 mark each)

A card is drawn at random from a pack of 52 cards. Find the following probabilities:

- a) $P(\text{a spade}) = \frac{13}{52} = \frac{1}{4}$ ✓
- b) $P(\text{a red card}) = \frac{26}{52} = \frac{1}{2}$ ✓ **4**
- c) $P(\text{not a club}) = \frac{39}{52} = \frac{3}{4}$ ✓
- d) $P(\text{an ace or a jack}) = \frac{8}{52} = \frac{2}{13}$ ✓

(10)

Question 4:
(1 mark each)

A bag contains 6 red, 9 blue and 5 yellow balls. If a ball is drawn at random, find the probability that it is:

- a) blue $P(\text{blue}) = \frac{9}{20}$ ✓
- b) not yellow $P(\overline{\text{yellow}}) = \frac{15}{20} = \frac{3}{4}$ ✓
- c) neither red nor blue $P(\overline{\text{neither red or blue}}) = \frac{5}{20} = \frac{1}{4}$ ✓ **3**

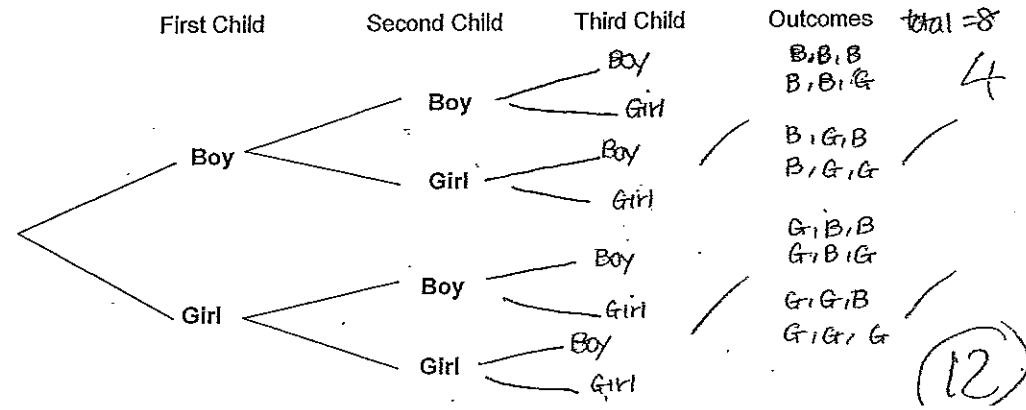
Question 5:
(1 mark each)

For each of the following probabilities, use probability terms to describe the likelihood of each outcome occurring

- a) $P(\text{event occurring}) = 0.5$ even chance ✓
- b) $P(\text{event occurring}) = 0.04$ highly unlikely ✓
- c) $P(\text{event occurring}) = 1$ certain ✓ **5**
- d) $P(\text{event occurring}) = 0.75$ likely ✓
- e) $P(\text{event occurring}) = 0$ impossible ✓
- f) $P(\text{event occurring}) = 0.1$ unlikely ✓

Question 6:
(4 marks)

The diagram below represents the possible outcomes of a family having two children. Extend the tree diagram to show all the possible outcomes if the family had three children.



Question 7:
(1 mark)

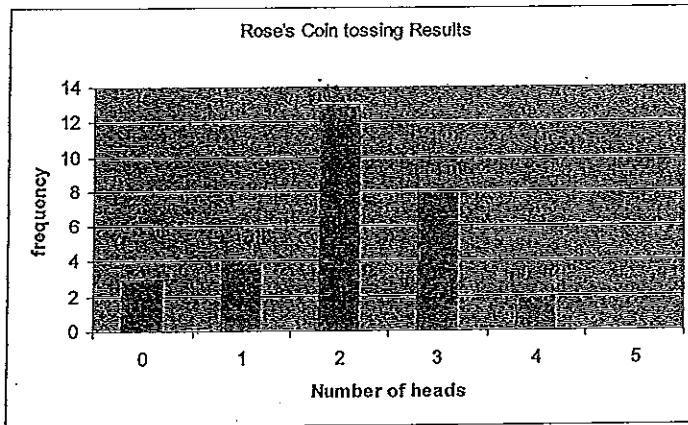
True or False

"The probability of an event occurring in an experiment is the same as its relative frequency"

False

Question 8:
(4 marks)

Emily tossed four coins at the same time 30 times and the number of heads was recorded each time. The column graph below shows the results.



From this experiment what is the probability that when four coins are thrown there will be:

a) no heads $P(\text{no heads}) = \frac{3}{30} = \frac{1}{10}$

b) two heads $P(\text{2 heads}) = \frac{13}{30}$

c) at least three heads $P(\text{at least 3 heads}) = \frac{10}{30} = \frac{1}{3}$

d) five heads $P(\text{5 heads}) = 0$

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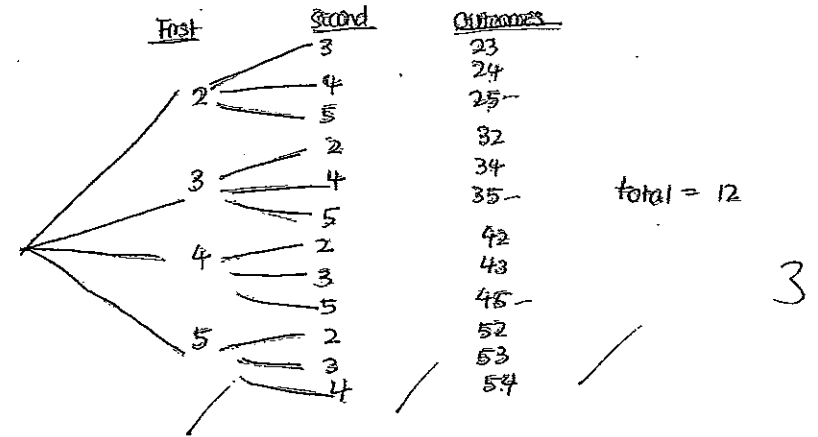
Question 9:

(4 marks)

There are four cards marked with the numbers 2, 3, 4 and 5. They are put in a box.

Two cards are selected at random one after the other (ie, the first card is not replaced before the second card is picked), to form a two-digit number.

a) Draw a tree diagram to show all the possible two-digit numbers that can be formed.



b) What is the probability that the number formed is less than 35?

$P(< 35) = \frac{5}{12}$ or 0.416

c) What is the probability that the number formed is divisible by 5?

$P(\text{divisible by 5}) = \frac{3}{12} = \frac{1}{4}$ or 0.25

Question 10:

(2 marks)

A bag contains 3 white and 4 brown balls. Two balls are drawn at random, the first not being replaced before the second is drawn. (sketching a quick tree diagram could help with the probabilities on each branch for each possible outcome could help here).

Calculate the following probabilities:

a) P(2 white balls picked)

$P = \frac{2}{12} = \frac{1}{6}$

b) P(A black and a white ball is picked)

(hint: remember that there are more than one ways to get a black and white pair)

$P = \frac{4 \times 3 + 3 \times 4}{12} = \frac{24}{12} = 2$

End of Test

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